CLAIMS

What is claimed is:

1. A device for patterning structures on a substrate, the device comprising:

an Atomic Force Microscope having at least one scanning tip;

a light emitting device;

a space being filled with a vapour of a material suitable for deposition onto said substrate in a Chemical Vapour Deposition process when decomposed; and

an electromagnetic field being strong enough around said scanning tip to decompose said vapour around said scanning tip,

wherein said light emitting device is to emit a light beam causing said electromagnetic field around said scanning tip, said light beam having an intensity that is not capable to decompose the vapour in areas other than around said scanning tip.

2. A device according to claim 1, wherein said light emitting device is a laser.

3. A device according to claim 1, wherein said scanning tip and said substrate is separated by a distance between 5 nm and 10 nm.

4. A device according claim 1, wherein said light emitting device is adapted to emit said light beam onto said scanning tip in such a way that a polarization of said light beam is parallel to a longitudinal axis of said scanning tip.

5. A device according to claim 1, wherein said scanning tip has a dimension between 5 nm and 20 nm.

6. A device according to claim 1, wherein said Atomic Force Microscope comprises a plurality of substantially parallel scanning tips.

7. A device according to claim 1, wherein the wavelength of said light beam is adapted to match the size of said scanning tip such that a sufficient amplification of said light beam is achieved.

8. A device according to claim 1, wherein one or more of the scanning tips are metalized.

9. A device according to claim 1, wherein said vapour is a gas selected from the group consisting of Halides, Hydrides, Metal Organic Compounds, $AuClPF_3$, $W(CO)_6$, $TiCl_4$, $TaCl_5$, WF_6, SiH_4, GeH_4, $AlH_3(NMe_3)_2$, NH_3, $AlMe_3$, $Ti(CH_2tBu)_4$, $Ti(OiPr)_4$, $Ti(NMe_2)_4$, $Cu(acac)_2$, and $Ni(CO)_4$.

10. A method for patterning structures on a substrate, comprising:

providing a substrate underneath a tip of an Atomic Force Microscope;

providing a vapour of a material, which is suitable for Chemical Vapour Deposition onto the substrate when decomposed, in a space between the tip and the substrate; and

exposing the tip to a light beam emitted by a light emitting device in such a way that the tip intensifies an electromagnetic near-field to such an extend that the vapour is decomposed, wherein an intensity of the light beam is not enough to decompose the vapour.

11. A method according to claim 10, wherein providing said vapour comprises providing a gas selected from the group consisting of Halides, Hydrides, Metal Organic Compounds, $AuClPF_3$, $W(CO)_6$, $TiCl_4$, $TaCl_5$, WF_6, SiH_4, GeH_4, $AlH_3(NMe_3)_2$, NH_3, $AlMe_3$, $Ti(CH_2tBu)_4$, $Ti(OiPr)_4$, $Ti(NMe_2)_4$, $Cu(acac)_2$, and $Ni(CO)_4$.

12. A method according to claim 10, wherein exposing said tip to said light beam comprises emitting said light beam onto said tip in such a way that a polarization of said light beam is parallel to a longitudinal axis of said tip.

13. A method according to claim 10, further comprising adapting a wavelength of said light beam to match the size of said tip such that a sufficient amplification of said light beam is achieved.

14. A method according to claim 10, further comprising applying a laser to emit said light beam and exposing said tip to said light beam.

15. A method according to claim 10, wherein said Atomic Force Microscope has multiple tips, further comprising providing said substrate underneath said multiple tips.

16. A method according to claim 15, further comprising metalizing one or more of said multiple tips.